

What is claimed is:

1. A compact, continuous-flow distillation system, comprising:
  - a housing;
  - a double-container boiler vessel in said housing for receiving water to be distilled;
  - a heater for boiling water in said vessel to produce water vapor in said vessel;
  - a condenser in said housing connected to said vessel to receive and condense said water vapor to provide distilled water;
  - a storage tank in said housing connected to said condenser for receiving and storing distilled water;
  - means in said housing for dispensing said distilled water; and
  - a noninvasive sensor for controlling the level of water in said boiler vessel.
2. The system of claim 1 wherein said boiler vessel includes:
  - an outer container having an inlet port for receiving said water to be distilled;
  - an inner container within and spaced from said outer container to form a preheated region between the containers for receiving water from said inlet port; and
  - an inner container inlet port for supplying water from said

preheated region to said inner container.

3. The system of claim 2, further including a cover for closing said boiler vessel, said cover supporting said heater in said inner container for heating water in said inner container and in said preheated region.

4. The system of claim 3, further including a controller connected to said heater for regulating the operation of the heater.

5. The system of claim 4, wherein said inner container is removably supported in said out container.

6. The system of claim 5, wherein said cover is removable to provide access to and removable of said inner container.

7. The system of claim 6, further including a drain port for said outer container.

8. The system of claim 4, wherein said inner container includes a peripheral, outwardly extending flange for removably supporting said inner container within said outer container.

9. The system of claim 8, wherein said cover is removably positioned on said flange to provide access to and removal of said inner container.

10. The system of claim 1, wherein said noninvasive sensor includes:  
a sensor housing having a sidewall and top and bottom caps, said housing being located outside said boiler vessel;  
a water line connecting the interior of said sensor housing to the

interior of said boiler vessel; and

a float switch assembly in said sensor housing and responsive to a water level in said boiler vessel.

11. The system of claim 10, further including a controller connected to said float switch.

12. The system of claim 11, wherein said float switch is located to detect a lowest desired water level in said boiler vessel, and said water line is connected to the interior of said boiler vessel at a lower end portion of the vessel.

13. The system of claim 11, wherein said float switch assembly includes upper and lower switches responsive to corresponding water levels in said boiler vessel, each of said switches being connected to said controller.

14. The system of claim 13, further including a water inlet line connected to supply water through the interior of said sensor housing to said water line to the interior of said boiler vessel.

15. The system of claim 14, further including a controllable valve in said water inlet line, said valve being connected to said controller for operation in response to at least one of said switches.

16. The system of claim 13, further including a water inlet line connected to supply water directly to the interior of said boiler vessel, and a controllable valve in said water inlet line.

17. The system of claim 16, wherein said valve is connected to said controller for operation in response to at least one of said switches.

18. The system of claim 13, wherein the interior of said sensor housing is vented to ambient atmosphere.

19. The system of claim 13, wherein the interior of said sensor housing above water level is connected to the interior of said boiler vessel above water level for pressure equalization.

20. The system of claim 13, wherein said upper-level switch is located to maintain a selected water level in said boiler vessel by controlling the operation of said valve.

21. The system of claim 20 wherein said upper and lower level switches are located to detect maximum and minimum water levels, respectively, in said boiler vessel.

22. A double container boiler vessel for a distiller, comprising:  
an outer container having an inlet port for receiving water to be distilled;

an inner container within and spaced from said outer container to form a preheater region between the containers for receiving water from said inlet port;

an inner container inlet port for supplying water from said preheater region to said inner container;

a peripheral, outwardly extending flange on said inner container for removably supporting the inner container within said outer container;

a cover removably positioned on said flange to close said boiler vessel and being removable to provide access to, and removal of, said inner container; and

a drain port in said outer container.

23. A noninvasive sensor for a distiller, comprising:

a sensor housing having a sidewall and top and bottom caps, said housing being located adjacent a distiller vessel for detecting water levels in the vessel;

a water line interconnecting the interior of the sensor housing with the interior of a distiller vessel below the water level to be detected;

a float switch assembly in said sensor housing and located to detect at least a lowest desired water level in a distiller vessel.

24. The sensor of claim 23, further including a water supply connected to said sensor housing for supplying water through said housing and said water line to a distiller vessel; and

a valve in said water supply responsive to said switch assembly for controlling the supply of water to the boiler vessel in accordance with a detected water level.